

Adoption of Good Management Practices by the Gaushalas (Cow-shed) in Karnataka State, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Gaushalas play a vital role in safeguarding the cattle wealth of our country. It is primarily occupied with providing shelter to cows and is catering mostly the needs of non-lactating, weak, unproductive and stray cattle. However, a few fore front Gaushalas also maintain nucleus herd for *in-situ* conservation of indigenous purebred cows and produce quality males so as to enhance productivity of indigenous breeds. With this view, present study was undertaken with the objective of understanding the level of adoption of good management practices by the Gaushalas. The study was conducted in Karnataka State involving 40 out of 80 registered Gaushalas, categorized as small (n=12), medium (n=18) and large (n=10) Gaushalas based on the herd size. Good management practices play an important role in improving the production performances of cattle, enhancing efficiency of animals in Gaushalas. In the present study 'adoption' was operationalised as the degree to which the good management practices viz., breeding, feeding, healthcare, general management and hygienic milk production, were adopted in the Gaushalas.

Keywords: Gaushalas; adoption; management; cattle; good.

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1. INTRODUCTION

The Gaushalas symbolize our cultural heritage for the animal welfare and is synonymous with the protection of cows and cattle wealth of the country. It is an institution established for the purpose of keeping, breeding, rearing and maintaining cattle or for the purpose of reception, protection and treatment of infirm, aged or diseased cattle. It is primarily focused on providing shelter to cows and caters mostly to the needs of non-lactating, weak, unproductive, and stray cattle [1]. As per the 20th Livestock Census, India is having about 192 million cattle population, 74% of which are indigenous and the rest 26% constituted as crossbred/exotic [2]. India being a vast reservoir of cattle genetic resources represented by 43 recognized indigenous cattle breeds [3]. The last half decade (2012-2019) has seen a decline in the total indigenous cattle population to a tune of 6.00 percent. The major factors for the decrease in indigenous cattle population are attributed to uneconomical returns due to low productivity and replacement of draft power in agriculture by mechanization. This has led to extra burden on the farmers' to take care of feeding, breeding and healthcare needs of the cattle. As a result, majority of this category of cattle population find shelter in Gaushalas instead of individual households. At present, India is having more than 4,500 Gaushalas registered under Animal Welfare Board of India (AWBI) and different State Gaushala Act that provides grant in aid for the sustenance and development of Gaushala all over the country. However, due to growing consensus for protection and conservation of our cattle resources, institutions like Gaushalas have gained significant importance over the time. However, the potential of Gaushalas is yet to be tapped by its stakeholders. Therefore, by adoption of good management practices (GMPs) and addressing the key constraint areas in Gaushala, we can enhance the potential of productivity of cattle by many folds. According to Rashtriya Gokul Mission, 2014 development of Integrated Indigenous Cattle Centers – "Gaushalas" envisages for enhancement of productivity of indigenous breeds through optimization of modern farm management practices and promotion of common resource management [4]. Yadav (2007) reiterated from his study that due to meagre resources and lack of appropriate veterinary health care, Gaushalas endeavored two prolonged strategies i.e., separating the old, infirm and unproductive cattle from the productive herd and integrating ethno-

veterinary treatment with the conventional animal health care system [1]. Sadana (2008) revealed that several Gaushalas in the country were following innovative methods for raising output from cows and bulls e.g. enhanced utilization of bull power for rural activities, electricity generation, production of young bulls for export to other states, production of methane, Liquefied Petroleum Gas (LPG) and liquid carbon dioxide from biogas, production of Panchagavya, medicines, vermi-compost and bio-pesticide for use in natural and organic agriculture [5]. Similar studies indicated that, there was appreciable improvement in milk productivity traits (percentage gain over period 1994 to 2008) like lactation milk yield, peak yield and lactation length by 45.74, 20.85 and 31.37%, respectively, in Haryana cows due to scientific breeding and management in Gaushalas at Jind in Haryana State [6]. Furthermore, Sharma *et al.* (2010) highlighted from their study in Gaushala at Jaipur district of Rajasthan State that a majority of positive cattle i.e. 10 of 30 (33.33%) and three of eight (37.50%) samples from adults and calves, respectively, were infected with fungal infections like geophilic dermatophyte (predominant infection of *Microsporiumgypseum*) followed by zoophilic dermatophyte (*Trichophytonmentagrophytes*). Contaminating fungi viz., *Aspergillus* spp., *Penicillium* spp. and *Mucor* spp. were also identified during the study which largely occurred, due to poor health care management of cattle in Gaushalas [7]. The evidences of several studies conducted on overall adoption of good or improved management practices in dairy farming also presented similar results. Cheke (2015) in his study on adoption of improved dairy management, conducted in Maharashtra State, revealed that majority (72.50%) of the dairy farmers belonged to medium level of adoption followed by 15.83% in low and 11.67% in high level of adoption category [8]. Singh (2015) in his study on adoption of good farming practices in central plain and eastern plain zones of Uttar Pradesh observed that majority (86.25%) of respondents had low level of adoption followed by 7.50% as high and 7.50% as medium level of adoption [9]. On similar lines, Gupta (2017) in his study on good dairy management practices conducted in central plain zone of Uttar Pradesh revealed that more than half of the respondents (55.83%) belonged to medium level of adoption category, followed by 27.56% and 16.67% in low and high level of adoption category, respectively [10,11,12,13]. Therefore, keeping this in view the objective of the present study was to investigate

the level of adoption of good management practices in the Gaushalas of Karnataka State.

2. MATERIALS AND METHODS

The study was conducted in Karnataka State during the year 2017-2018 in 40 Gaushalas, selected randomly out of total 80 registered Gaushalas present throughout the State. The 40 selected Gaushalas were further categorized as small (n=12), medium (n=18) and large size (n=10) Gaushalas based on the herd size defined as below 50 as small, medium (n=51-150) and large (above 150), respectively. The primary data was collected from the concerned individuals/stakeholders involved in maintaining the Gaushalas through well-developed interview schedule. Good Management Practices (GMPs) was operationally defined as the degree to which a respondent actually adopts a practice for the purpose of measurement of extent of adoption of GMPs in their Gaushalas at the time of investigation and it was determined by a simple adoption schedule developed by the investigator. The practices were classified into five categories namely, breeding, feeding healthcare, general management and clean milking practices. The schedule contained 29 practices, from each of the areas as mentioned above. Against each of the practices, there were two columns representing 'adopted', and 'not adopted' with score of 1 and 0, respectively. The adoption scores were then converted to adoption index by applying the following formula:

$$\text{Adoption index} = \left(\frac{\text{Obtained Adoption Score}}{\text{Maximum Obtainable Adoption Score}} \right) \times 100$$

According to the final score values obtained, the Gaushalas were categorized into three groups namely, 'Low', 'Medium' and 'High' adopter categories considering the mean and standard deviation. The total score obtained by Gaushalas was calculated and with the help of following formula their adoption level for various practices and overall adoption level were calculated.

3. RESULTS AND DISCUSSION

The effective functioning of Gaushalas can be studied through assessing the level of GMPs adopted by the selected Gaushalas. Hence, effort has been undertaken to study the adoption level of GMPs by the selected Gaushalas in the study area. The GMPs play an important role in improving the production performances of cattle, enhancing efficiency of managing animal welfare

practices in Gaushalas. In the present study, 'adoption' was operationalised as the degree to which the good management practices viz. breeding, feeding, healthcare, general management, clean milk production and animal welfare practices were adopted in the Gaushalas.

- 1. Breeding Practices:** From Table 1, it could be inferred that a majority (60%) in case of large size Gaushalas, followed by 28% in medium and 25% in small Gaushalas, could identify 'the cows in heat', as detection of heat symptoms in cows on time, which requires experience and skilled technical manpower and hence majority of large Gaushalas could detect the heat symptoms better than medium and small size Gaushalas. Majority (70%) in case of large Gaushalas, followed by 61% of medium, and 67% of small Gaushalas adopted 'Breeding through 'Artificial Insemination/Natural Services'. However, majority of the Gaushalas preferred Natural Service to Artificial Insemination as bulls were maintained in the Gaushala herd. A large majority (83%) of small Gaushalas adopted 'pregnancy diagnosis by veterinarian' as compared to 67% in medium and 60% by large Gaushalas. This could be due to 'inadequate knowledge and experience in case of small Gaushalas about pregnancy diagnosis. Therefore, veterinarians were preferred for such services.
- 2. Feeding Practices:** It is inferred from Table 2 that a large majority (80%) in large Gaushalas, followed by a significant (44%) in medium and 33% in small Gaushalas adopted 'Green fodder cultivation' as majority of the large Gaushalas possessed adequate land for fodder cultivation. All the large Gaushalas (100%), followed by majority (78%) in medium Gaushalas and small Gaushalas (75%) adopted 'stall-feeding or semi-stall feeding' for equitable supply of balanced ration of feed and fodder to the cattle. Majority (80%) in large Gaushalas, followed by 67% in medium Gaushalas and 58% in small Gaushalas were 'Fed extra ration during pregnancy' so as to supplement extra calories required and to maintain the health during the time of pregnancy. This might be due to feeding factor that has been well known and being prioritized in the Gaushalas under study.

- 3. Healthcare:** Table 3 shows that a large majority (90) in large Gaushalas, followed by equal majority in small (83%) and medium (83%) Gaushalas adopted 'Vaccination against HS/FMD/BQ diseases before onset of monsoon' as majority of the Gaushalas were aware about the vaccination schedule and timely vaccination services were provided by Department of Animal Husbandry & Veterinary Services against these common diseases. A large majority (90%) in large Gaushalas, followed by medium (72%) and small Gaushalas (67%) adopted 'Treatment of sick animals by veterinarian' as most of the large Gaushalas could afford as well as access to veterinary services as compared to small Gaushalas. Majority (70%) in large Gaushalas, followed by 67% in medium and half in small Gaushalas (50%) adopted 'Isolation of sick animal from the herd' in order to avoid outbreaks of disease and to keep close supervision on the diseased cattle.
- 4. General Management Practices:** Table 4 revealed that a large majority in medium (89%) and in large Gaushalas (80%) and most of the small Gaushalas (67%) adopted 'Provision of sufficient ventilation in cattle shed'. This is due to the fact that, majority of large Gaushalas provided sufficient space for ventilation for fresh air circulation in Gaushalas which directly impacts animal health and its performance. Further, large majority (90%) in large Gaushalas, followed by medium (78%) and 67% in small Gaushalas adopted 'Daily cleaning of cattle shed before

milking'. This might be due to the reason that the care and concern for the cattle and clean milk production under hygienic condition by majority of large Gaushalas were more compared to small and medium Gaushalas. All the Gaushalas (100%) adopted 'Proper maintenance of record' as all the Gaushalas are registered under different organizations thus it becomes mandatory for them to maintain proper records. Equal large majority (90%) of large Gaushalas, followed by medium (89%) and 83% in small Gaushalas provided 'Sufficient and clean water' to cattle as majority of the Gaushalas had access to water source.

- 5. Clean Milking Practices:** It is inferred from the Table 5 that, majority (80%) in large Gaushalas, followed by 67% in medium and 58% in small Gaushalas adopted 'Cleaning of udder with clean water & antiseptic solution before milking', as it prevented harmful germs to contaminate the milk. Almost 100% in large Gaushalas, followed by 94% in medium and 67% percent in small Gaushalas practiced adoption of 'Full hand method of milking' as it was perceived and recommended as the right method of milking by majority of large Gaushalas. Further, large majority (90%) of large Gaushalas, followed by 83% in medium and 75% in small Gaushalas adopted 'Using of clean utensils for milking'. This might be due to the reason that majority of the large Gaushalas had better awareness and concern, attached more importance to the clean milk production practices.

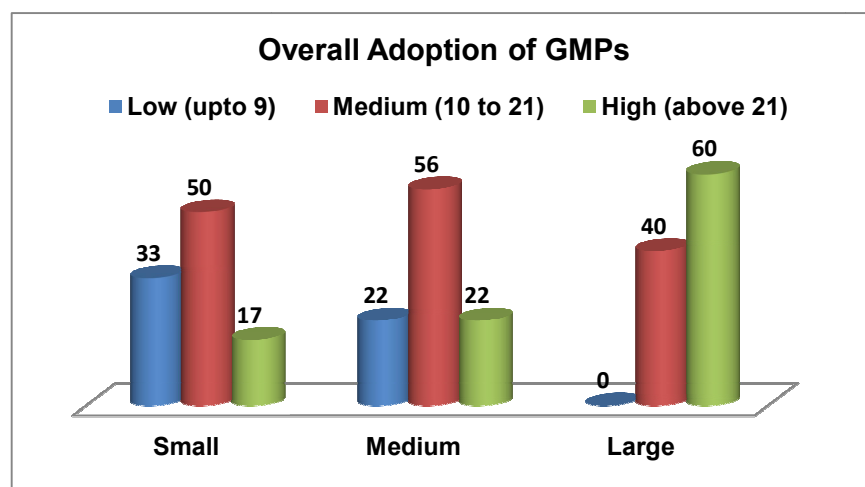


Fig. 1. Overall adoption of GMPs by the Gaushalas

Table 1. Distribution of Gaushalas according to their adoption level in breeding practices

Sl.No.	Breeding Practices	Small		Medium		Large	
		Adopted n (%)	Not Adopted n (%)	Adopted n (%)	Not Adopted n (%)	Adopted n (%)	Not Adopted n (%)
1	Detection of heat	3(25)	9(75)	5(28)	13(72)	6(60)	4(40)
2	Breeding through N.S/A.I.	8(67)	4(33)	11(61)	7(39)	7(70)	3(30)
3	Insemination of dairy cattle within 12-18 hrs of onset of estrus.	4(33)	8(67)	6(33)	12(67)	3(30)	7(70)
4	Pregnancy diagnosis by veterinarian.	10(83)	2(17)	12(67)	6 (33)	6(60)	4(40)
5	Pregnancy detection by external signs.	2(17)	10(83)	6(33)	12(67)	4(40)	6(60)

Note: n- Frequency (Figures in parenthesis indicate percentages)

Table 2. Distribution of Gaushalas according to their adoption level in feeding practices

Sl. No.	Feeding Practices	Small		Medium		Large	
		Adopted n (%)	Not Adopted n(%)	Adopted n (%)	Not Adopted n(%)	Adopted n (%)	Not Adopted n(%)
1	Cultivation of green fodder crops	4(33)	8 (67)	8 (44)	10 (56)	8 (80)	2 (0.20)
2	Stall feeding or semi-stall feeding	9 (75)	2 (25)	14 (78)	4 (22)	10(100)	0(0)
3	Feeding of extra ration during pregnancy	7 (58)	5 (42)	12 (67)	6 (33)	8 (80)	2 (20)
4	Preparation and feeding of silage	2 (17)	10 (83)	4 (22)	14 (78)	5 (50)	5 (50)
5	Dipping of concentrate feed in water one hour before feeding	6 (50)	6 (50)	8 (44)	10 (56)	6 (60)	4 (40)
6	Provision for mineral mixture powder	6 (50)	6 (50)	10 (56)	8 (44)	8 (80)	2 (20)
7	Milch animals fed with extra concentrate feed @ 1kg to 2.5kg	6 (50)	6 (50)	10 (56)	8 (44)	7 (70)	3 (30)

Note: n- Frequency (Figures in parenthesis indicate percentages)

Table 3. Distribution of Gaushalas according to their adoption level in healthcare practices

SI. No.	Healthcare Practices	Small		Medium		Large	
		Adopted n (%)	Not Adopted n (%)	Adopted n (%)	Not Adopted n (%)	Adopted n (%)	Not Adopted n (%)
1	Vaccination against HS/FMD/BQ disease before onset of monsoon.	10(83)	2(17)	15(83)	3(17)	9(90)	1 (10)
2	Treatment of sick animal by veterinarian	8(67)	4(33)	13(72)	5(28)	9(90)	1(10)
3	Isolation of sick animal from the herd	6(50)	6(50)	12(67)	6(33)	7(70)	3(30)
4	Deworming of cattle	7(58)	5(42)	12(67)	4(22)	7(70)	3(30)

Note: n- Frequency (Figures in parenthesis indicate percentages)

Table 4. Distribution of Gaushalas according to their adoption level in general management practices

SI. No.	General Management Practices	Small		Medium		Large	
		Adopted n (%)	Not Adopted n (%)	Adopted n (%)	Not Adopted n (%)	Adopted n (%)	Not Adopted n (%)
1	Provision of sufficient ventilation in cattle shed	8 (67)	4 (33)	16 (89)	2(11)	8(80)	2(20)
2	Weaning of calf	7(58)	5(42)	16(89)	2(11)	9(90)	1(10)
3	Daily cleaning of cattle shed before milking	8(67)	4(33)	14(78)	4(22)	9(90)	1(10)
4	Record maintenance	12(100)	0(0)	18(100)	0(0)	10(100)	0(0)
5	Milking of dairy cattle at fixed time	10(83)	2(17)	15(83)	3(17)	8(80)	2(20)
6	Provide sufficient clean and fresh water to cattle.	10(83)	2(17)	16(89)	2(11)	9(90)	1(10)
7	Disinfection of animal shed every week by disinfectant	6(50)	6(50)	12(67)	6(33)	7(70)	3(30)
8	Care of new born calf	12(100)	0(0)	18(100)	0(0)	10(100)	0(0)

Note: n- Frequency (Figures in parenthesis indicate percentages)

Table 5. Distribution of Gaushalas according to their adoption level in clean milking practices

SI. No.	Practices	Small		Medium		Large	
		Adopted n (%)	Not Adopted n (%)	Adopted n (%)	Not Adopted n (%)	Adopted n (%)	Not Adopted n(%)
1	Cleaning of udder with clean water & antiseptic solution before milking	7(58)	5(42)	12(67)	6(33)	8(80)	2(20)
2	Practicing full hand method of milking	8(67)	4(33)	17(94)	1(6)	10(100)	0(0)
3	Using of clean utensils for milking	9(75)	3(25)	15(83)	3(17)	9(90)	1(10)
4	Washing of milker hand with soap/antiseptic solution before milking	7(58)	5(42)	12(67)	6(33)	8(80)	2(20)
5	Personal hygiene while milking	9(75)	3(25)	16(89)	2(11)	9(90)	1(10)

Note: n- Frequency (Figures in parenthesis indicate percentages)

Table 6. Distribution of Gaushalas (n=40) according to their overall adoption level in good management practices

SI. No.	Adoption categories	Small	Medium	Large
		n(%)	n(%)	n(%)
1	Low (upto 9)	4(33)	4(22)	0(0)
2	Medium(10 to 21)	6(50)	10(56)	4(40)
3	High(above 21)	2(17)	4(22)	6(60)
	Total	12(100)	18(100)	10(100)

Note: n- Frequency (Figures in parenthesis indicate percentages)

6. Overall Adoption Level of Gaushalas in Good Management Practices: Data presented in Table 6 and Fig. 1 indicated that the distribution of Gaushalas according to their overall adoption of GMPs revealed that in case of large Gaushalas majority of 60% belonged to 'High adopter categories' and 40% belonged to 'Medium adopter categories'. In medium Gaushalas, 56% of them belonged to 'Medium adopter category' and equal percent belonged to small and high adopter category (22% each). Among small Gaushalas, 50% of the Gaushalas belonged to 'Medium adopter category', another 33% and 17% belonged to 'Low and high adopter category', respectively. This clearly indicates that majority of the small and medium Gaushalas were not completely aware of the GMPs. This may be due to few major reasons such as lack of resources and inadequate training for non-adoption of GMPs.

4. CONCLUSION

In case of overall adoption of GMPs, most of the large Gaushalas performed better than medium and small Gaushala. The non-adoption of GMPs in small and medium Gaushalas was attributed to lack of resources and adequate training facilities. The major constraints of Gaushalas were 'Inferior quality of bulls', 'Limited access to veterinary services' and 'Inadequate funds/capital and training'. The identified perceived important factors affecting the performance of Gaushalas were 'Regular financial support', 'Good infrastructural facilities' and 'Government support for training and development'. In conclusion, there is a strong need to sensitize and train the Gaushalas management about the GMPs through adequate extension, policy and financial support for holistic development of Gaushalas in the country.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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